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## Soluble ST2 and Galectin-3 levels in CKD and Relationship to Progression and Clinical Outcomes

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**Background:** Soluble ST2 (sST2) and Galectin-3, novel biomarkers of heart failure and cardiovascular stress, predict cardiovascular event and mortality. However, the relationships with renal function and adverse outcomes are less certain. The purpose of this study was to determine whether sST2 and Galectin-3 associated with chronic kidney disease (CKD) progression and adverse clinical outcomes.

**Method:** We measured baseline sST2 and galectin-3 concentrations in CKD patient cohort at our institution included between October 2013 and December 2014. Primary outcome was CKD progression {(end-stage renal disease [ESRD] or  $\geq 50\%$  reduction in estimated GFR [eGFR] from baseline)}. Secondary outcome was the composite of CKD progression, cardiovascular events and death. We used Cox proportional hazards model to evaluate associations between sST2 and galectin-3 level with renal and clinical outcomes.

**Results:** A total of 352 patients were enrolled in this study. At baseline, Log sST2 was directly associated with serum creatinine ( $r = 0.418$ ,  $P < 0.001$ ) and urine protein-to-creatinine ratio (UPCR) ( $r = 0.282$ ,  $P < 0.001$ ). Log galectin-3 was also directly associated with serum creatinine ( $r = 0.185$ ,  $P < 0.001$ ) and UPCR ( $r = 0.134$ ,  $P = 0.022$ ). Cox regression analysis showed that baseline sST2 level was independently predicted the CKD progression (hazard ratio [HR] per SD increase in log-transformed sST2 concentration, 1.560; 95% confidence interval [CI], 1.195 – 2.036;  $P = 0.001$ ) and composite outcome (HR, 1.369; 95% CI, 1.087 – 1.724;  $P = 0.008$ ) after adjustment for age, sex, smoking, diabetes, hypertension, cardiovascular disease, renin-angiotensin-aldosterone receptor blocker, calcium channel blocker, b-blocker, diuretics and antiplatelet agents. Baseline galectin-3 level was independently associated with CKD progression (HR per SD increase in log-transformed galectin-3 concentration, 1.549; 95% CI, 1.186 – 2.025;  $P = 0.001$ ) and composite outcome (HR, 1.376; 95% CI, 1.098 – 1.726;  $P = 0.006$ ) after adjustment for confounding variables.

**Conclusion:** In conclusion, elevated levels of sST2 and galectin-3 are significantly associated with CKD progression and adverse clinical outcomes.